

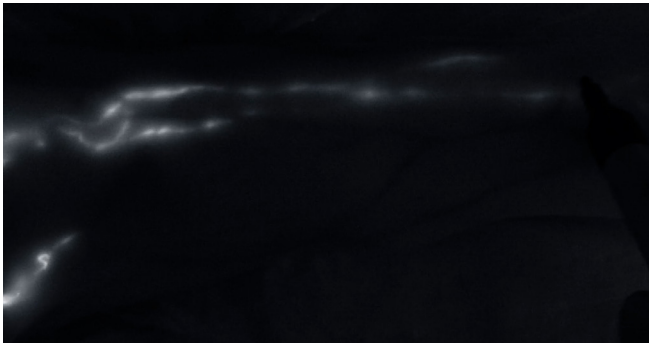
Deep, single lymphovenous anastomosis at the level of the medial knee for stage 1 lymphedema

Clinical case presented by Christian Taeger, MD,
Specialist for Plastic and Hand Surgery, Munich, Germany

Case report

This is a patient with a very early onset of stage 1 lymphedema. An ICG scan on the day before surgery showed mostly intact lymphatics. However, when the scan was repeated immediately before surgery, some dermal backflow was detected. It was decided to make the incision at the level of the medial knee. Only one small, very deep lymphatic vessel was visible, which made establishing the anastomosis challenging. It was revised several times until it was patent.

Preoperative (ICG) evaluation the day before surgery

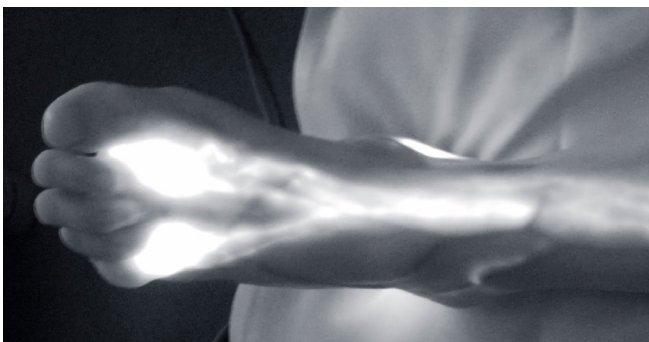


An ICG fluorescence scan is performed on the dorsum of the foot. The flow of the dye in the lymphatic vessels indicates an early stage of secondary lymphedema. The lymphatic vessels are marked with a marker for surgical planning.



Augmented reality view for documentation issues and planning for surgery. The lymphatics are marked in green and the crossings of the veins in blue.

Diagnostics on the day of surgery



When repeating the ICG scan, the linear pattern with the dye moving through the vessels can be seen. The crossings of the vein and dermal backflow are visible.

Intraoperative treatment



Identification of the vessels using medical loupes. Then switching to the surgical microscope to perform supermicrosurgery and get high magnification.

Tip for ZEISS PENTERO 800 S

Optimal positioning and adjustments of the microscope are essential to reduce tremor.



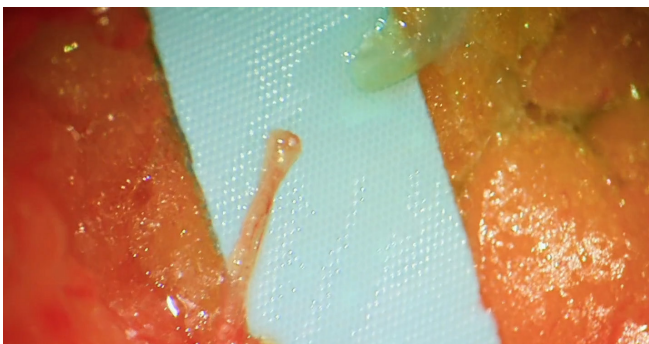
The lymphatic vessel is stained with Patent Blue – the diameter of the vessel is very small.



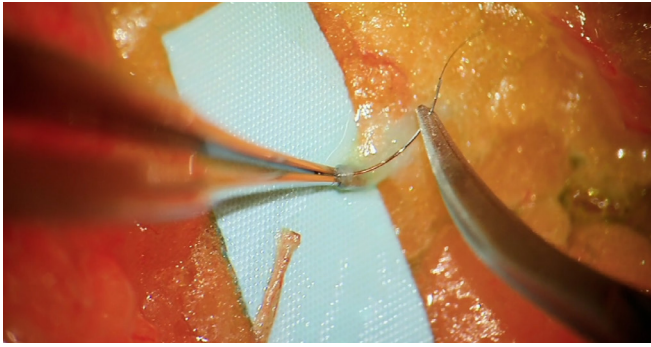
A micro clip is put on the proximal part of the vessel. Lymphatic drainage is performed to get a bigger diameter of the vessel.



Cutting the vessel distally to the clip.



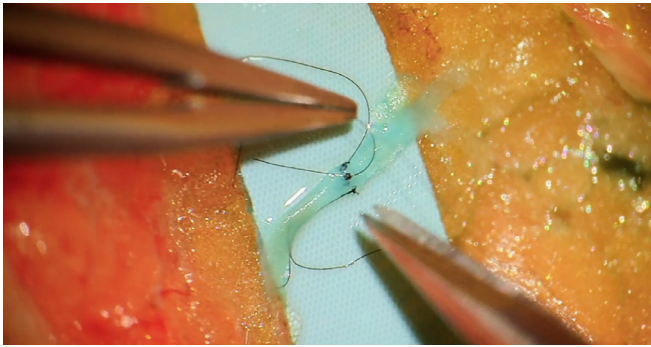
Preparing a venule that matches the diameter of the vessel to avoid differences in size. Lymphatic fluid is draining out of the vessel on the right side.



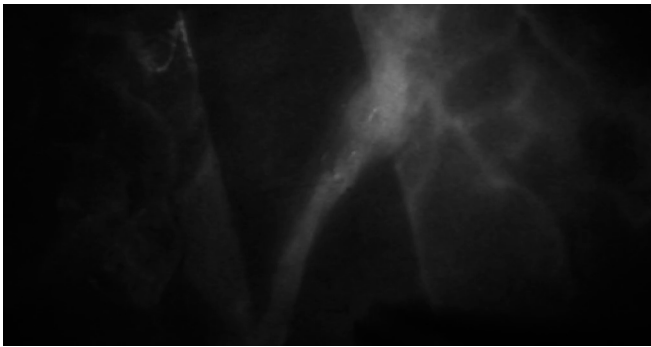
An 11.0 stitch is used for the anastomosis. Using the dilator in order not to stitch the back wall of the vessel. The surgical microscope is set to a high zoom factor.

Tip for ZEISS PENTERO 800 S

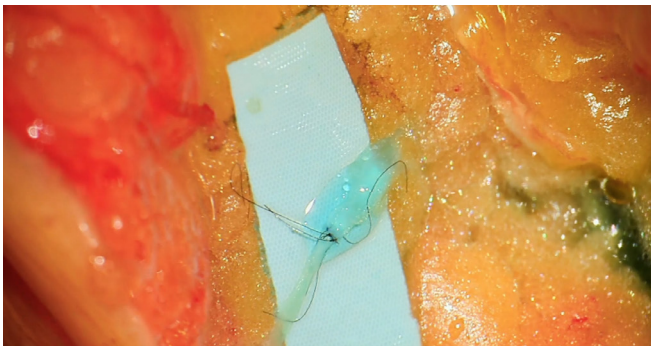
Use the Resolution Enhancer for magnification levels of more than 40x.



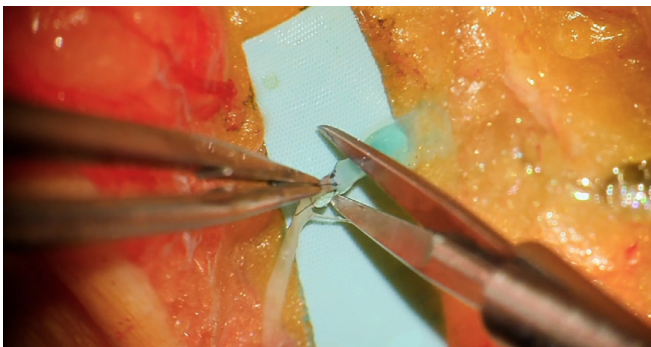
Even with very small vessels, several stitches may be necessary to ensure a patent anastomosis.



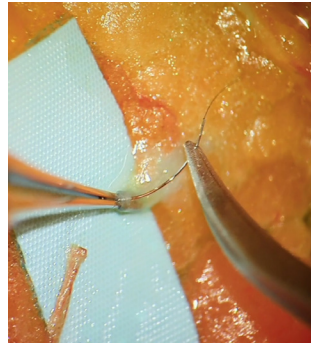
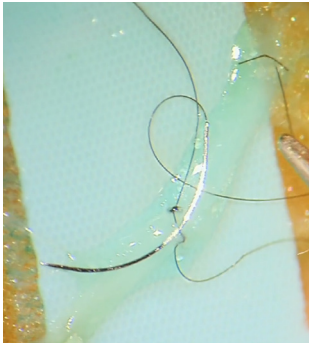
The clinical assessment aims to determine if the anastomosis is patent.



The congestion of lymphatic fluid on the right side of the image indicates that the anastomosis is not patent.



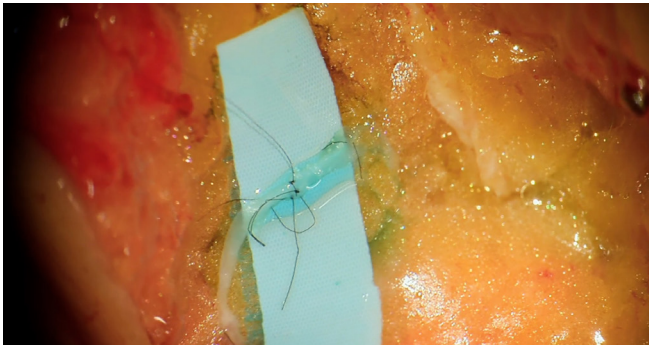
Revising the anastomosis and starting all over again.



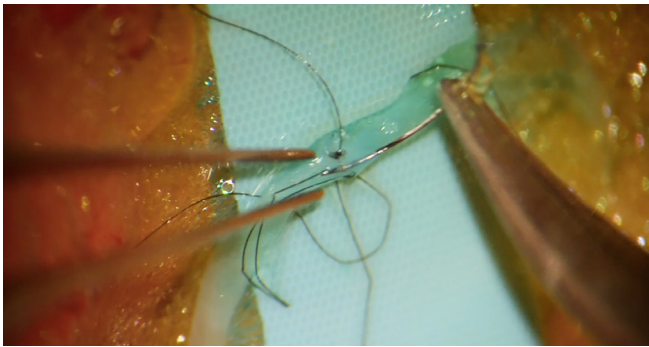
Switching between high and low zoom helps to save time during resewing the anastomosis.

Tip for ZEISS PENTERO 800 S

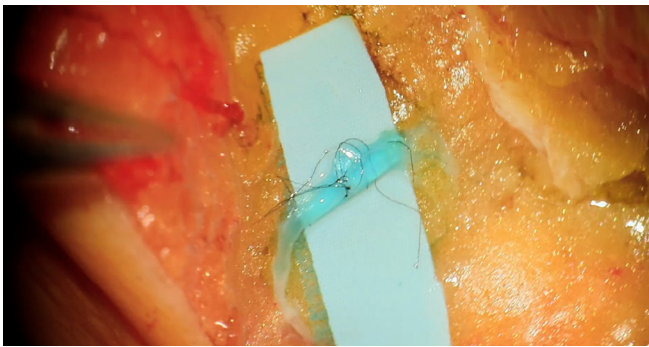
Use the foot control panel to activate the ZoomMemory function hands-free.



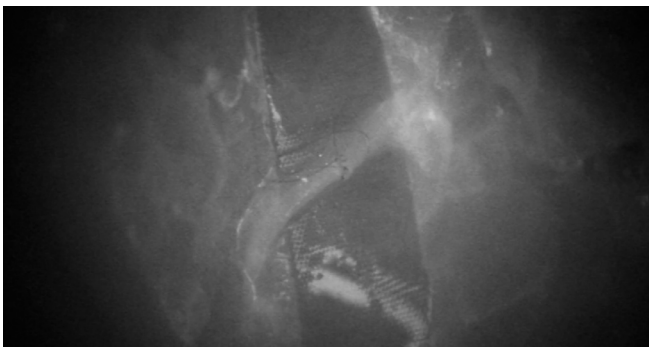
During manual lymphatic drainage, some leakage is observed. Adding another stitch.



Even very small gaps are closed by adding more knots to prevent leakage.



Lymphatic drainage shows that the fluid is draining into the vein – no more leakage of the anastomosis is visible.



Final ICG imaging shows no leakage – the anastomosis is patent.

Tip for ZEISS PENTERO 800 S

Use the microscope-integrated ICG imaging technology ZEISS INFRARED 800 to check vessels.

Clinical case report

Further information



“ I think precision is the key to an anastomosis that lasts not only for some days, but for years.

Christian Taeger, MD

Specialist for Plastic and Hand Surgery Munich, Germany

Do you want to know more?



Visit the ZEISS PENTERO 800 S product page

<https://zeiss.com/pentero-website>

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